WHAT IS CLAIMED IS:

1. An image processing apparatus for processing RGB image data output from an image capturing element including a primary-color filter, comprising:

a middle-high range luminance component compensation section for compensating for a middle-high range luminance component of a low-frequency luminance signal generated based on the RGB image data such that the low-frequency luminance signal has substantially an ideal frequency luminance characteristic which is lower than or equal to a predetermined frequency.

2. An image processing apparatus for processing RGB image data output from an image capturing element including a primary-color filter, comprising:

a middle-high range luminance component extraction section for extracting a middle-high range luminance component which has a zero amplitude at an angular frequency $\omega=\pi$ and a maximum amplitude at an angular frequency ω between $\pi/2$ and π from a first luminance signal generated based on RGB image data; and

a first synthesis section for adding the middle-high range luminance component to a low-frequency

luminance signal generated based on the RGB image data so as to generate a second luminance signal.

3. An image processing apparatus according to claim 2, wherein the middle-high range luminance component extraction section uses at least one filter having a size of an even-number of pixels to arithmetically process the first luminance signal.

4. An image processing apparatus according to claim 3, wherein the filter having a size of an even-number of pixels is a two-dimensional filter and has coefficients symmetrically arranged with respect to a x-direction and a y-direction.

5. An image processing apparatus according to claim 4, wherein:

the filter having a size of an even-number of pixels includes a first low-pass filter having a differentiation capability and a second low-pass filter; and

a difference between an output obtained by arithmetically processing the first luminance signal using the first low-pass filter and an output obtained

by arithmetically processing the first luminance signal using the second low-pass filter is output as the middle-high range luminance component.

6. An image processing apparatus according to claim 5, further comprising:

a first interpolation section for interpolating missing components among R-, G-, and B-components for each pixel before the generation of the first luminance signal,

wherein the first interpolation section interpolates missing components by arithmetically processing the RGB image data using a filter having a size of 3 pixels × 3 pixels.

7. An image processing apparatus according to claim 3, wherein:

the filter having a size of an even-number of pixels includes a first low-pass filter having a differentiation capability and a second low-pass filter; and

a difference between an output obtained by arithmetically processing the first luminance signal using the first low-pass filter and an output obtained by arithmetically processing the first luminance signal

using the second low-pass filter is output as the middle-high range luminance component.

8. An image processing apparatus according to claim 7, further comprising:

a first interpolation section for interpolating missing components among R-, G-, and B-components for each pixel before the generation of the first luminance signal,

wherein the first interpolation section interpolates missing components by arithmetically processing the RGB image data using a filter having a size of 3 pixels × 3 pixels.

9. An image processing apparatus according to claim 8, further comprising:

a second interpolation section for interpolating missing components among R-, G-, and B-components for each pixel before the generation of the low-frequency luminance signal,

wherein the second interpolation section interpolates missing components by arithmetically processing the RGB image data using a filter having a size of an even-number of pixels.

10. An image processing apparatus according to claim 9, wherein at least one of the first and second interpolation sections interpolates the RGB image data by using a median method for a G-component and a bilinear method for R- and B-components.

11. An image processing apparatus according to claim 9, further comprising:

a median filtering section for removing, with a median filter, noise inherent to the image capturing element which is contained in a color-difference signal generated based on a RGB image signal from the second interpolation section;

wherein the median filtering section changes the size of the median filter according to an amount of the noise.

12. An image processing apparatus according to claim 3, further comprising:

a first interpolation section for interpolating missing components among R-, G-, and B-components for each pixel before the generation of the first luminance signal,

wherein the first interpolation section interpolates missing components by arithmetically

processing the RGB image data using a filter having a size of 3 pixels × 3 pixels.

13. An image processing apparatus according to claim 2, further comprising:

a first interpolation section for interpolating missing components among R-, G-, and B-components for each pixel before the generation of the first luminance signal,

wherein the first interpolation section interpolates missing components by arithmetically processing the RGB image data using a filter having a size of 3 pixels × 3 pixels.

14. An image processing apparatus according to claim 13, further comprising:

a second interpolation section for interpolating missing components among R-, G-, and B-components for each pixel before the generation of the low-frequency luminance signal,

wherein the second interpolation section interpolates missing components by arithmetically processing the RGB image data using a filter having a size of an even-number of pixels.

15. An image processing apparatus according to claim 14, wherein at least one of the first and second interpolation sections interpolates the RGB image data by using a median method for a G-component and a bilinear method for R- and B-components.

16. An image processing apparatus according to claim 14, further comprising:

a median filtering section for removing, with a median filter, noise inherent to the image capturing element which is contained in a color-difference signal generated based on a RGB image signal from the second interpolation section;

wherein the median filtering section changes the size of the median filter according to an amount of the noise.

17. An image processing apparatus according to claim 2, further comprising:

a second interpolation section for interpolating missing components among R-, G-, and B-components for each pixel before the generation of the low-frequency luminance signal,

wherein the second interpolation section

interpolates missing components by arithmetically processing the RGB image data using a filter having a size of an even-number of pixels.

18. An image processing apparatus according to claim 17, further comprising:

a median filtering section for removing, with a median filter, noise inherent to the image capturing element which is contained in a color-difference signal generated based on a RGB image signal from the second interpolation section;

wherein the median filtering section changes the size of the median filter according to an amount of the noise.

19. An image processing apparatus according to claim 2, further comprising:

a middle/high-range luminance component extraction section for extracting at least one of a middle-range luminance component and a high-range luminance component based on the second luminance signal; and

a second synthesis section for adding at least one of the middle-range luminance component and the high-

range luminance component to the second luminance signal so as to generate a third luminance signal.

20. An image processing apparatus according to claim 19, wherein the middle/high-range luminance component extraction section arithmetically processes the second luminance signal by using one filter which has an adjustable coefficient.